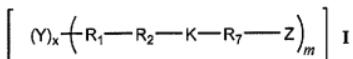


Amendments to the Claims:

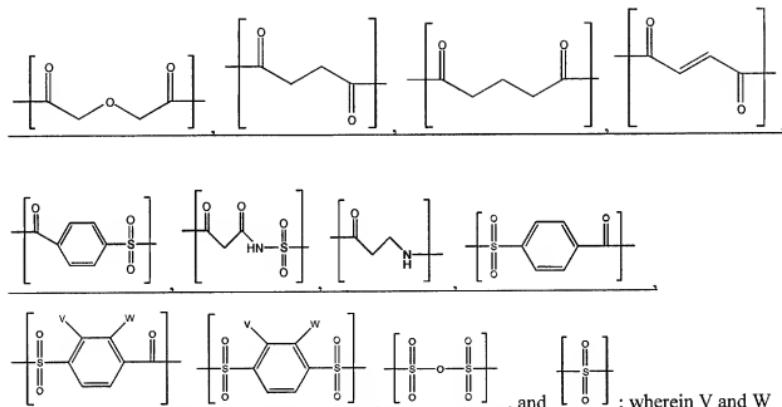
1. (Currently amended) An alkyl-linked nucleotide composition non-homogeneous solid support consisting essentially of [[a]] the general formula:



wherein Y is a solid support; x = 1; R<sub>1</sub> is a covalent bond between Y and R<sub>2</sub>, or R<sub>1</sub> is a divalent acyl group, a substituted or a non-substituted divalent alkyl group or a divalent alkyl group substituted with an amine, a halogen, a nitro, a hydroxyl, a sulphydryl, a carboxyl, a carbonyl, an alkyl, an acetyl, a benzyl, a pyridinyl-methylene group, a substituted or a non-substituted divalent cycloalkyl group, a substituted or a non-substituted divalent heteroalkyl group, a substituted or a non-substituted divalent heterocycloalkyl group, a substituted or a non-substituted divalent aryl group or a divalent aryl group substituted with a halogen, an alkyl, a nitro, an amine, a hydroxyl, a sulphydryl, a carboxyl group, a substituted or a non-substituted divalent heteroaryl group, or a combination thereof; R<sub>2</sub> is a substituted or a non-substituted divalent alkyl group or a divalent alkyl group substituted with an amine, a halogen, a nitro, a hydroxyl, a sulphydryl, a carboxyl group, a carbonyl, an alkyl, an acetyl, a benzyl, a pyridinyl-methylene group, a substituted or a non-substituted divalent cycloalkyl group, a substituted or a non-substituted divalent heteroalkyl group, a substituted or a non-substituted divalent heterocycloalkyl, a substituted or a non-substituted divalent heteroaryl group, or a combination thereof; K is NH; R<sub>7</sub> is (P)<sub>n</sub> where P is a phosphate or thiophosphate and n is at least one or R<sub>7</sub> is a phosphate group mimic, Z is a 5'-nucleosidyl group or a 5'-nucleosidyl group wherein the nucleoside 5'-nucleosidyl group is not naturally occurring, or a derivative thereof; and m is at least one;

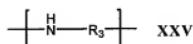
wherein the solid support has a loading of an alkyl-linked nucleotide having a range of about 20% to about 50%; and

wherein the phosphate group mimic is selected from the group consisting of:



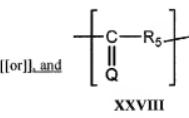
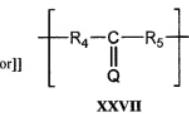
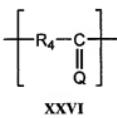
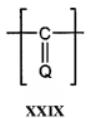
are each independently selected from the group consisting of H, NH<sub>2</sub>, and OH.

2. (Currently amended) The alkyl-linked nucleotide composition non-homogeneous solid support of claim 1, wherein R<sub>2</sub> further comprises consists of a divalent heteroalkyl group having the general formula:



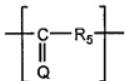
wherein R<sub>3</sub> is a substituted or a non-substituted divalent alkyl group or a divalent alkyl group substituted with an amine, a halogen, a nitro, a hydroxyl, a sulphydryl, a carboxyl group, a carbonyl, an alkyl, an acetyl, a benzyl, a pyridinyl-methylene group, a substituted or a non-substituted divalent cycloalkyl group, a substituted or a non-substituted divalent heteroalkyl group, a substituted or a non-substituted divalent heterocycloalkyl, a substituted or a non-substituted divalent heteroaryl group, or a combination thereof.

3. (Currently amended) The alkyl-linked nucleotide composition non-homogeneous solid support of claim 2, wherein R<sub>1</sub> further comprises consists of a divalent acyl group selected from the group consisting of:



wherein Q = O or NH<sub>2</sub>%; R<sub>4</sub> is a substituted or a non-substituted divalent alkyl group or a divalent alkyl group substituted with an amine, a halogen, a nitro, a hydroxyl, a sulphydryl, a carboxyl, a carbonyl, an alkyl, an acetyl, a benzyl, a pyridinyl-methylene group, a substituted or a non-substituted divalent cycloalkyl group, a substituted or a non-substituted divalent heteroalkyl group, a substituted or a non-substituted divalent heterocycloalkyl group, a substituted or a non-substituted divalent aryl group, a substituted or a non-substituted divalent heteroaryl group, or a combination thereof; and R<sub>5</sub> is a substituted or a non-substituted divalent alkyl group or a divalent alkyl group substituted with an amine, a halogen, a nitro, a hydroxyl, a sulphydryl, a carboxyl, a carbonyl, an alkyl, an acetyl, a benzyl, a pyridinyl-methylene group, a substituted or a non-substituted divalent cycloalkyl group, a substituted or a non-substituted divalent heteroalkyl group, a substituted or a non-substituted divalent heterocycloalkyl group, a substituted or a non-substituted divalent aryl group or a divalent aryl group substituted with a halogen, an alkyl, a nitro, an amine, a hydroxyl, a sulphydryl, a carboxyl group, a substituted or a non-substituted divalent heteroaryl group, or a combination thereof.

4. (Currently amended) The alkyl-linked nucleotide composition non-homogeneous solid support of claim 3, wherein R<sub>1</sub> consists of the general formula:



XXVIII

5. (Canceled)

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6. (Canceled)

7. (Canceled)

8. (Canceled)

9. (Currently amended) The nucleotide affinity medium alkyl-linked nucleotide non-homogeneous solid support of claim [[8]]1, wherein the solid support includes at least one member selected from the group consisting of an acrylamide, agarose, methacrylate, cellulose, nylon, silica, glass, ceramic, a magnetized particle, nitrocellulose, polystyrene, a thermoresponsive polymer, and derivatives thereof.

10. (Currently amended) The nucleotide affinity medium alkyl-linked nucleotide non-homogeneous solid support of claim [[9]]1, wherein the solid support is a beaded agarose.

11. (Canceled)

12. (Canceled)

13. (Canceled)

14. (Canceled)

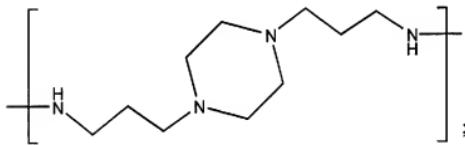
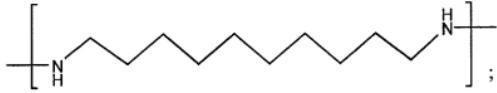
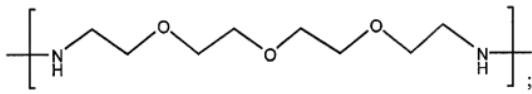
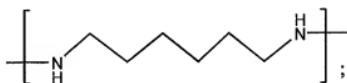
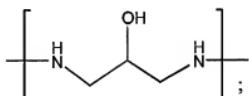
15. (Canceled)

16. (Canceled)

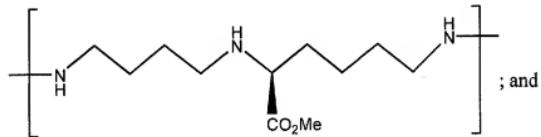
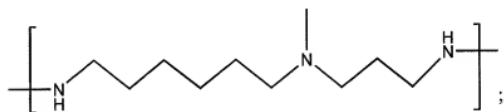
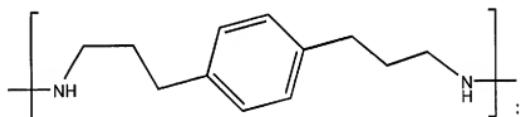
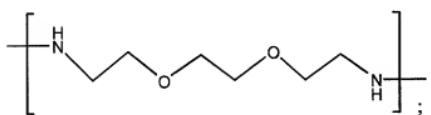
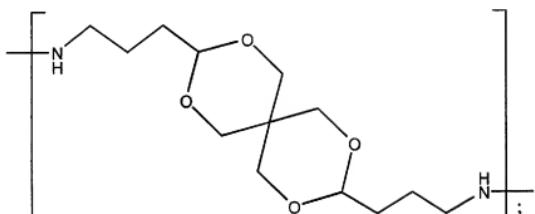
17. (Original) The alkyl-linked nucleotide composition non-homogeneous solid support of claim 1 wherein R<sub>7</sub> is (P)<sub>n</sub>.

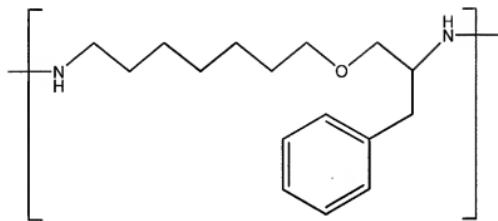
18. (Original) The alkyl-linked nucleotide composition non-homogeneous solid support of claim 17, wherein n is 1, 2, 3, or 4.

19. (Currently amended) The alkyl-linked nucleotide composition non-homogeneous solid support of claim 1, wherein  $[[R_2]] - R_2 - K -$  is a linker selected from the group consisting of:

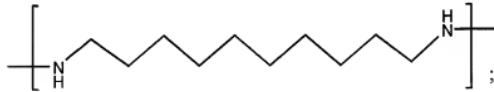
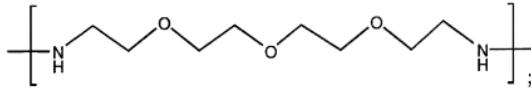
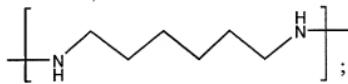
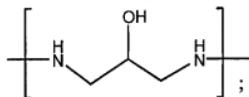


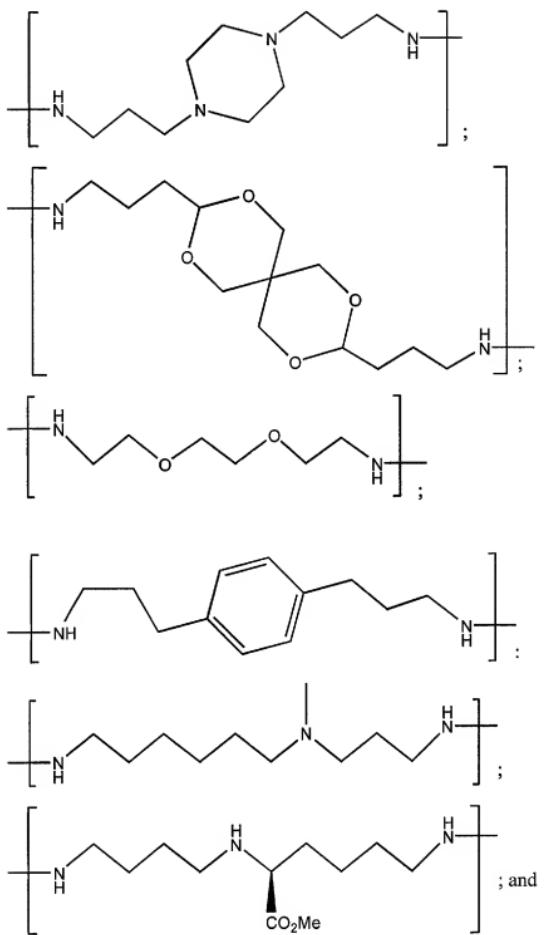
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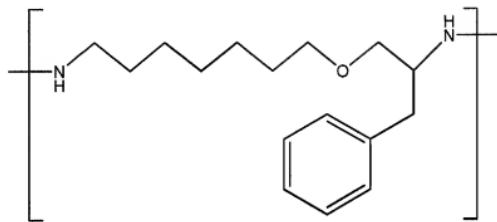




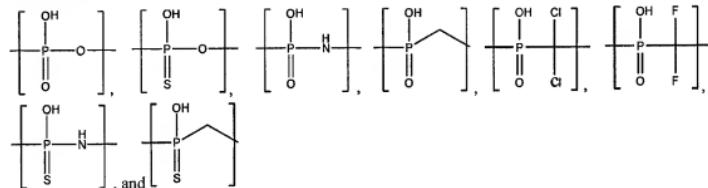
20. (Currently amended) The alkyl-linked nucleotide composition non-homogeneous solid support of claim 1, wherein if m is more than one, then [[R<sub>2</sub>]] -R<sub>2</sub>-K- is at least one linker selected from the group consisting of:







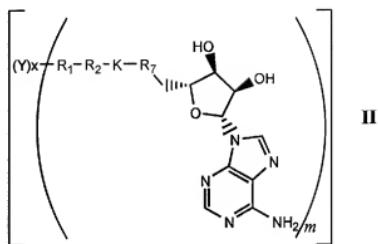
21. (Currently amended) The alkyl-linked nucleotide composition non-homogeneous solid support of claim 17, wherein P is selected from the group consisting of



or an ionized variant or a salt thereof.

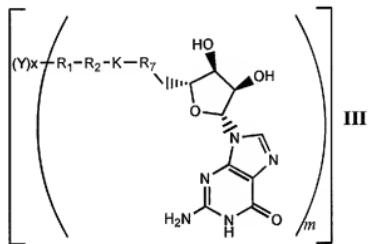
22. (Currently amended) The alkyl-linked nucleotide composition non-homogeneous solid support of claim 1, wherein the nucleoside 5'-nucleosidyl group is selected from the group consisting of [[an]] a -5-deoxy-5'-adenosin[[e]]yl radical, a -5-deoxy-5'-guanosinyl radical, a -5-deoxy-5'-cytidin[[e]]yl radical, a -5-deoxy-5'-thymidin[[e]]yl radical, and [[an]] a -5-deoxy-5'-uridin[[e]]yl radical, or an analog thereof.

23. (Currently amended) The alkyl-linked nucleotide composition non-homogeneous solid support of claim 22, wherein the nucleoside 5'-nucleosidyl group is [[an]] a -5-deoxy-5'-adenosin[[e]]yl radical, said alkyl-linked nucleotide composition non-homogeneous solid support consisting essentially of [[a]] the general structure:



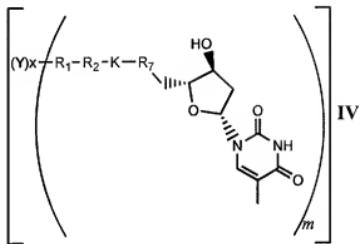
or an ionized variant or a salt thereof.

24. (Currently amended) The alkyl-linked nucleotide composition non-homogeneous solid support of claim 22, wherein the nucleoside 5'-nucleosidyl group is a -5-deoxy-5'-guanosinyl radical, said alkyl-linked nucleotide composition non-homogeneous solid support consisting essentially of [[a]] the general structure:



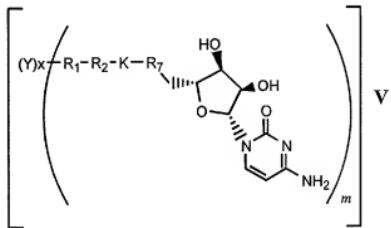
or an ionized variant or a salt thereof.

25. (Currently amended) The alkyl-linked nucleotide composition non-homogeneous solid support of claim 22, wherein the nucleoside 5'-nucleosidyl group is a -5-deoxy-5'-thymidin[[e]]yl radical, said alkyl-linked nucleotide composition non-homogeneous solid support consisting essentially of [[a]] the general structure:



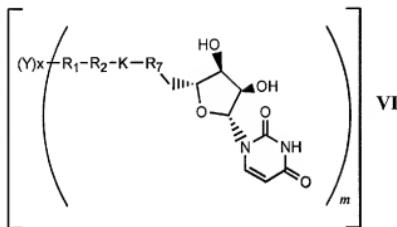
or an ionized variant or a salt thereof.

26. (Currently amended) The alkyl-linked nucleotide composition non-homogeneous solid support of claim 22, wherein the nucleoside 5'-nucleosidyl group is a -5-deoxy-5'-cytidin[e]yl radical, said alkyl-linked nucleotide composition non-homogeneous solid support consisting essentially of [[a]] the general structure:



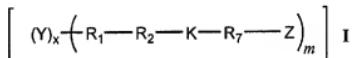
or an ionized variant or a salt thereof.

27. (Currently amended) The alkyl-linked nucleotide composition non-homogeneous solid support of claim 22, wherein the nucleoside 5'-nucleosidyl group is [[an]] a -5-deoxy-5'-uridin[e]yl radical, said alkyl-linked nucleotide composition non-homogeneous solid support consisting essentially of [[a]] the general structure:



or an ionized variant or a salt thereof.

28. (Currently amended) A method for synthesizing a nucleotide affinity medium consisting essentially of [[a]] the general formula:



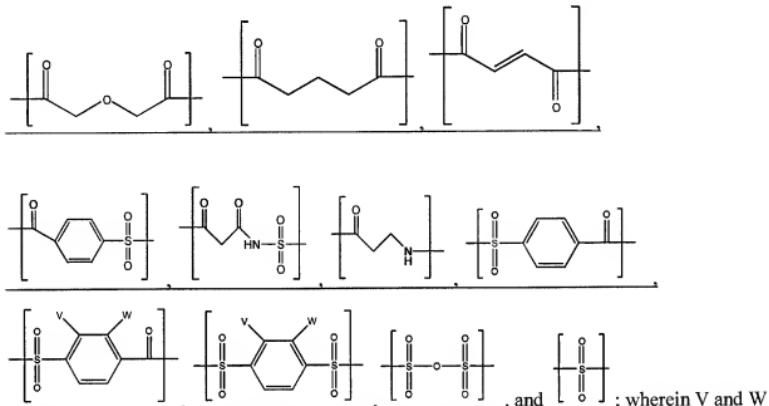
comprising the steps of:

- a) coupling at least one linker to a solid support in a suitable coupling buffer, wherein said linker is R<sub>2</sub> or a combination of R<sub>1</sub> and R<sub>2</sub>;
- b) end-capping at least a portion of reactive sites remaining on said solid support after said coupling step; and
- c) reacting a terminal phosphate or thiophosphate group of a nucleotide with said linker coupled to said solid support,  
wherein Y is a solid support; x = 1; R<sub>1</sub> is a covalent bond between Y and R<sub>2</sub>, or R<sub>1</sub> is a divalent acyl group, a substituted or a non-substituted divalent alkyl group or a divalent alkyl group substituted with an amine, a halogen, a nitro, a hydroxyl, a sulphydryl, a carboxyl group, a carbonyl, an alkyl, an acetyl, a benzyl, a pyridinyl-methylene group, a substituted or a non-substituted divalent cycloalkyl group, a substituted or a non-substituted divalent heteroalkyl group, a substituted or a non-substituted divalent heterocycloalkyl group, a substituted or a non-substituted divalent aryl group or a divalent aryl group substituted with a halogen, an alkyl, a nitro, an amine, a hydroxyl, a sulphydryl, a carboxyl group, a substituted or a non-substituted divalent heteroaryl group, or a combination thereof; R<sub>2</sub> is a substituted or a non-substituted

divalent alkyl group or a substituted divalent alkyl group substituted with an amine, a halogen, a nitro, a hydroxyl, a sulphydryl, a carboxyl group, a carbonyl, an alkyl, an acetyl, a benzyl, a pyridinyl-methylene group, a substituted or a non-substituted divalent cycloalkyl group, a substituted or a non-substituted divalent heteroalkyl group, a substituted or a non-substituted divalent heterocycloalkyl, a substituted or a non-substituted divalent heteroaryl group, or a combination thereof; K is NH; R<sub>7</sub> is (P)<sub>n</sub> where P is a phosphate or thiophosphate and n is at least one or R<sub>7</sub> is a phosphate group mimic; Z is a 5'-nucleosidyl group or a 5'-nucleosidyl group wherein the nucleoside 5'-nucleosidyl group is not naturally occurring, or a derivative thereof; and m is at least one;

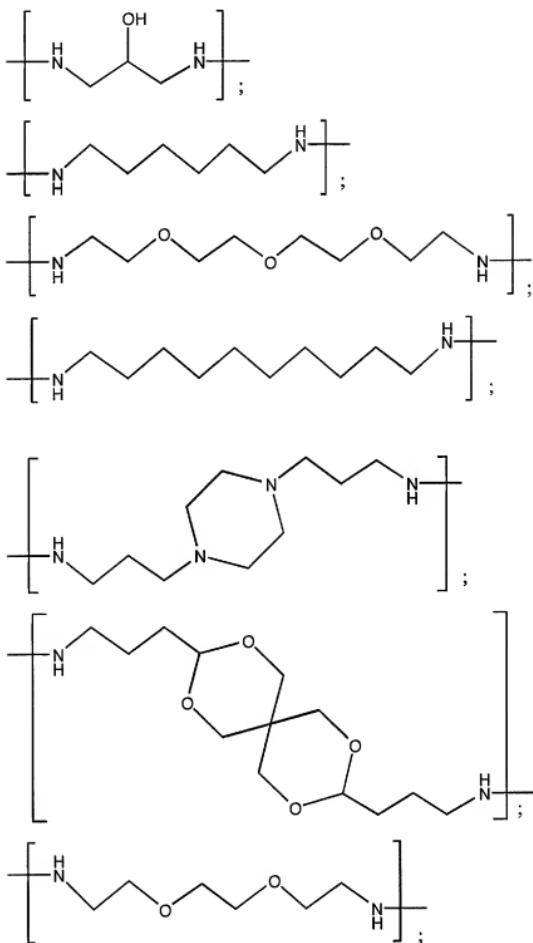
wherein the solid support has a loading of an alkyl-linked nucleotide having a range of about 20% to about 50%, and

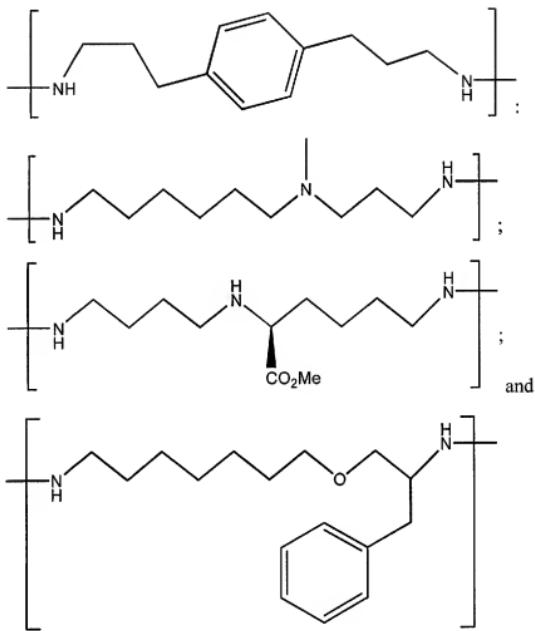
wherein the phosphate group mimic is selected from the group consisting of:



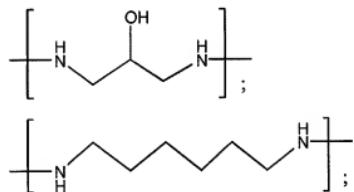
are each independently selected from the group consisting of H, NH<sub>2</sub>, and OH.

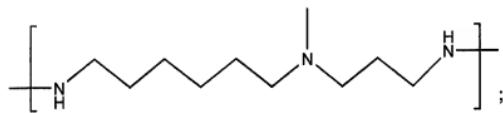
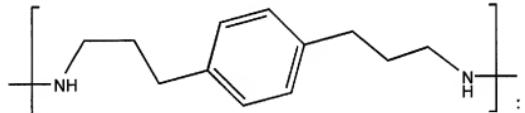
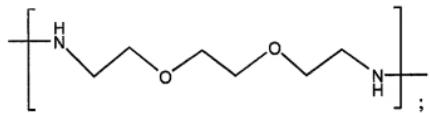
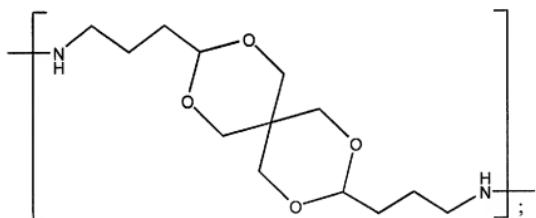
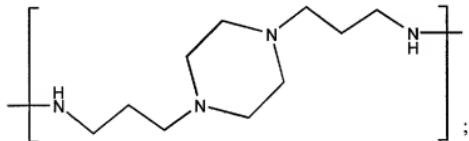
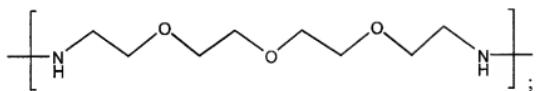
29. (Currently amended) The method of claim 28, wherein  $[[R_2]]-R_2-K-$  is a linker selected from the group consisting of:

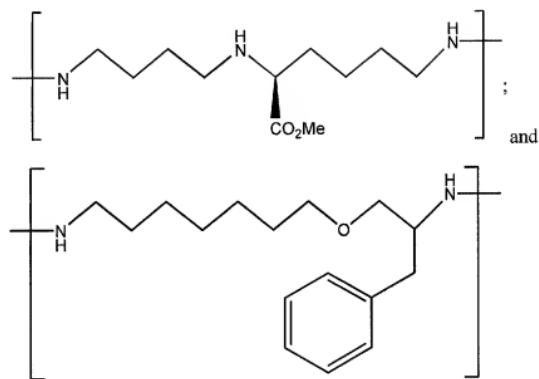




30. (Currently amended) The method of claim 28, wherein if m is more than one, then  $[[R_2]]-R_2-K-$  is at least one linker selected from the group consisting of:

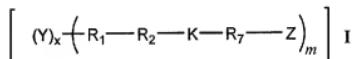






31. (Currently amended) A method for screening a test compound comprising the steps of:

- a) contacting a proteome with a nucleotide affinity medium consisting essentially of [Ia] the general formula:

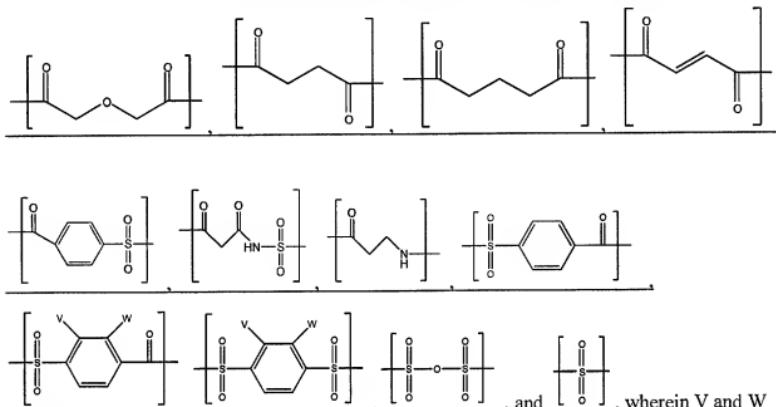


wherein Y is a solid support; x = 1; R<sub>1</sub> is a covalent bond between Y and R<sub>2</sub>, or R<sub>1</sub> is a divalent acyl group, a substituted or a non-substituted divalent alkyl group or a divalent alkyl group substituted with an amine, a halogen, a nitro, a hydroxyl, a sulphydryl, a carboxyl group, a carbonyl, an alkyl, an acetyl, a benzyl, a pyridinyl-methylene group, a substituted or a non-substituted divalent cycloalkyl group, a substituted or a non-substituted divalent heteroalkyl group, a substituted or a non-substituted divalent heterocycloalkyl group, a substituted or a non-substituted divalent aryl group or a divalent aryl group substituted with a halogen, an alkyl, a nitro, an amine, a hydroxyl, a sulphydryl, a carboxyl group, a substituted or a non-substituted divalent heteroaryl group, or a combination thereof; R<sub>2</sub> is a substituted or a non-substituted divalent alkyl group or a divalent alkyl group substituted with an amine, a halogen, a nitro, a

hydroxyl, a sulphydryl, a carboxyl group, a carbonyl, an alkyl, an acetyl, a benzyl, a pyridinyl-methylene group, a substituted or a non-substituted divalent cycloalkyl group, a substituted or a non-substituted divalent heteroalkyl group, a substituted or a non-substituted divalent heterocycloalkyl, a substituted or a non-substituted divalent heteroaryl group, or a combination thereof; K is NH; R<sub>7</sub> is (P)<sub>n</sub> where P is a phosphate or thiophosphate and n is at least one or R<sub>7</sub> is a phosphate group mimic, Z is a 5'-nucleosidyl group or a 5'-nucleosidyl group wherein the nucleoside 5'-nucleosidyl group is not naturally occurring, or a derivative thereof; and m is at least one;

wherein the solid support has a loading of an alkyl-linked nucleotide in a range of about 20% to about 50%; and

wherein the phosphate group mimic is selected from the group consisting of:



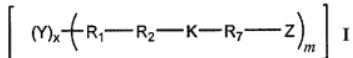
are each independently selected from the group consisting of H, NH<sub>2</sub>, and OH; [I.]

b) washing the nucleotide affinity medium with a buffer, whereby non-specifically bound components of the proteome are eluted from the nucleotide affinity medium and specific components of the proteome remain bound to the nucleotide affinity medium;

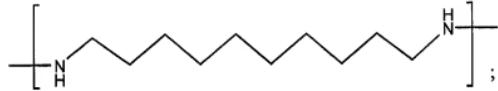
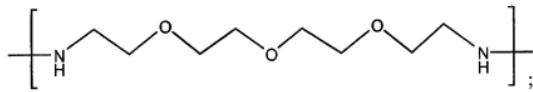
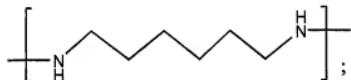
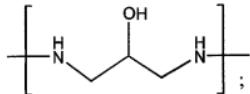
c) contacting the nucleotide affinity medium bound with specific components of the proteome with at least one test compound;

- d) eluting from the nucleotide affinity medium components of the proteome that are specifically displaced by the test compound; and
- e) identifying the components of the proteome that are specifically displaced by the test compound from the nucleotide affinity medium.

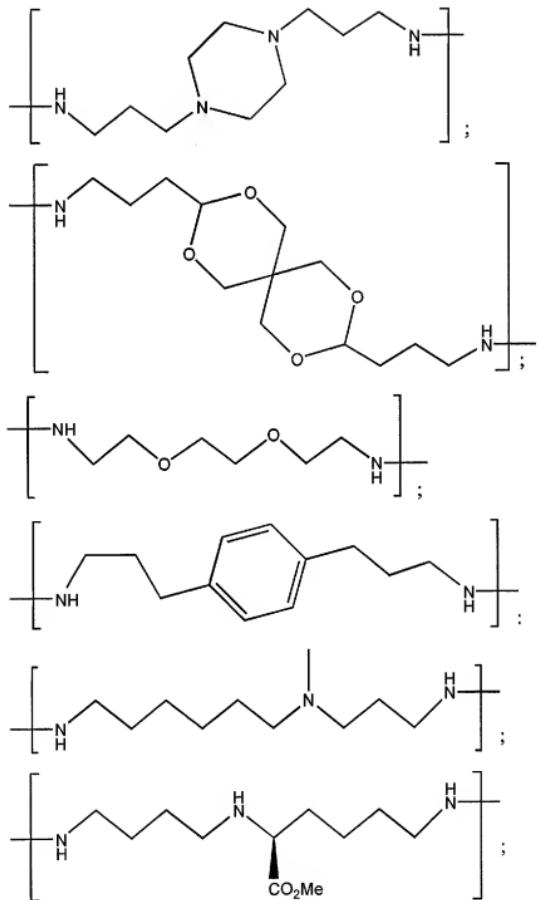
32. (New) An alkyl-linked nucleotide non-homogeneous solid support consisting essentially of the general formula:



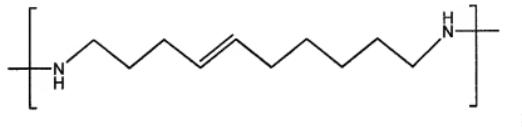
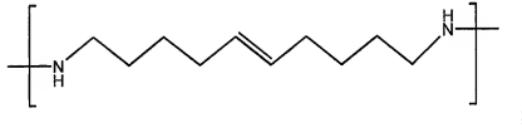
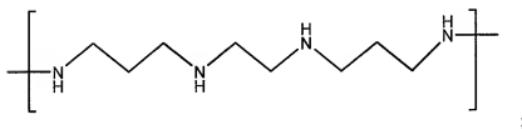
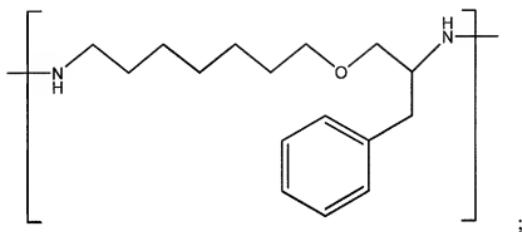
wherein Y is a solid support; x = 1; R<sub>1</sub> is a covalent bond between Y and R<sub>2</sub>, or R<sub>1</sub> is a divalent acyl group; K is NH; R<sub>7</sub> is (P)<sub>n</sub> where P is a phosphate or a thiophosphate and n is at least one; and m is at least one; Z is a 5'-nucleosidyl group or a 5'-nucleosidyl group wherein the 5'-nucleosidyl group is not naturally occurring, or a derivative thereof; and -R<sub>2</sub>-K- is selected from the group consisting of:

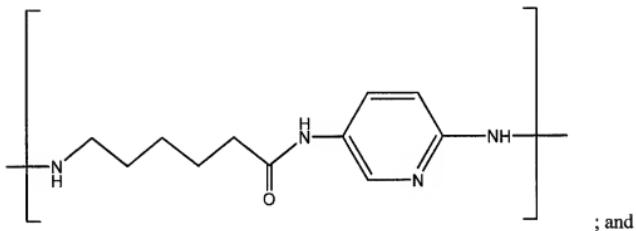
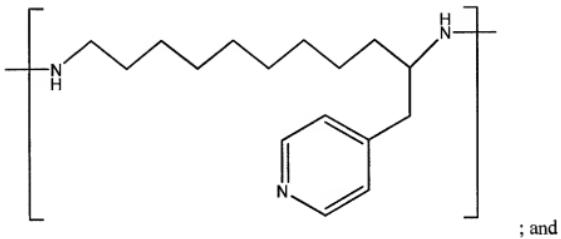
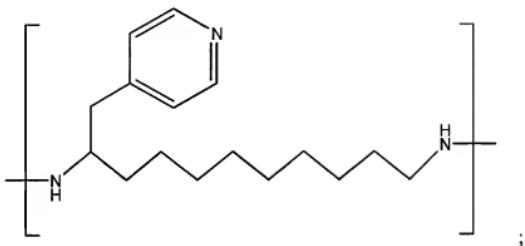


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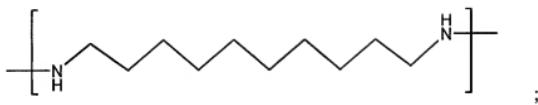


wherein the solid support has a loading of an alkyl-linked nucleotide having a range of about 20% to about 50%.

33. The alkyl-linked nucleotide non-homogeneous solid support of claim 32, wherein:  
R<sub>1</sub> is  $-C(=NH_2^+)-$ ;

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R<sub>2</sub> is:



P is phosphate; and

n is 3.